
Chapter 3: Engineering the IPE Module and the Application Module

For detailed information on engineering CCR, refer to Appendix D.

In engineering the IPE Module and the Application Module for Meridian Link and CCR, you are finding the answers to the following questions:

- For an existing IPE Module or Application Module with Meridian Link, can I add CCR? Or do I need to upgrade the module or add another IPE Module or Application Module?
- For an existing IPE Module or Application Module with CCR, can I add Meridian Link? Or do I need to upgrade the IPE Module or Application Module or add another IPE Module or Application Module?
- If I want to add Meridian Link or CCR or both to my Meridian 1 system, do I need an IPE Module or an Application Module? Do I need one, or more than one?

Table 8
X11 software compatibility matrix

Application	Rls. 17	Rls. 18	Rls. 19	Rls. 20	Rls. 21	Rls. 22
Meridian Link 4B	Yes	Yes	Yes	Yes	Yes	Yes
Meridian Link 4B and CCR 3B	Yes	Yes	Yes	Yes	Yes	Yes
Meridian Link 5	No	No	Yes	Yes	Yes	Yes
Meridian Link 5 and CCR 3B	No	No	Yes	Yes	Yes	Yes

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Calculating modules required

The following procedure describes how you can use the Meridian Configurator to calculate the capacity you require and determine the type and number of the modules needed to handle that capacity. Refer to the Meridian Configurator User Guide for the identity of each input field.

If you cannot use the Meridian Configurator, or if it is not supported in your market, use the manual procedure that follows this procedure.

New Application Modules are shipped with the MVME167 card.
Meridian Link and CCR co-residency is supported only on an IPE Module or an Application Module equipped with an MVME167 card.
Due to memory requirements, CCR Release 3B is not supported on older Application Modules using the MVME147 card. Customers cannot order MVME147-equipped Application Modules.

For the busiest hour of the year:

- 1 Enter the estimated number of inbound calls terminating directly at ACD agents or non-ACD sets at which Meridian Link alerts computer applications of such calls. Such calls should include calls terminating directly at third-party voice-response ports controlled by a Meridian Link application.

Enter the estimated number of such inbound calls that are subsequently transferred to another agent under the control of a Meridian Link-based application. A scenario might involve calls terminating at third-party voice-response ports controlled by the application and subsequently transferred to live agents.
- 2 Enter the estimated number of outbound calls originated by ACD agents using a preview dialing application based on Meridian Link.
- 3 Enter the estimated number of predictive dial calls to be originated on behalf of ACD or non-ACD agents using a predictive dialing application based on Meridian Link.
- 4 Estimate the number of calls to be transferred for a large HEVP application.
- 5 Enter the estimated number of inbound calls to receive routing treatment by means of an application based on Meridian Link HER.

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- 6** Enter the estimated number of inbound calls to be routed to Meridian Mail ports for treatment by an application based on Meridian Link HEVP.
 - 7** Enter the estimated number of calls that will receive basic CCR treatment (that is, they will require less than ten messages per call—to find out how to calculate the number of messages per call, see the description later in this chapter). Examples of this type of call are provided in the following sections.
 - 8** Enter the estimated number of calls that will receive typical CCR treatment (that is, they will require less than twenty messages per call—to find out how to calculate the number of messages per call, see the description later in this chapter). Examples of this type of call are provided in the following sections.
 - 9** Enter the estimated number of calls that will receive complex CCR treatment (that is, they will require about thirty messages per call—to find out how to calculate the number of messages per call, see the description later in this chapter). Examples of this type of call are provided in the following sections.
 - 10** Enter the total number of ACD DNIs for which the Meridian 1 system will provide statistics to CCR.

Table 9
Worksheet for engineering the IPE Module and Application Module

1	Number of incoming calls terminating directly at ACD agents or non-ACD sets at which Meridian Link alerts applications	
	Number of such calls that are transferred to another agent by a Meridian Link-based application	
2	Number of outgoing calls originated by ACD agents using preview dialing	
3	Number of predictive dial calls originated by ACD or non-ACD agents	
4	Number of calls transferred for a large HEVP application	
5	Number of incoming calls to receive HER treatment	
6	Number of incoming calls to receive HEVP treatment	
7*	Number of calls that will receive basic CCR treatment (10 or fewer messages per call)	
8*	Number of calls that will receive typical CCR treatment (about 20 messages per call)	
9*	Number of calls that will receive complex CCR treatment (30 or more messages per call)	
10	Number of ACD DN's providing statistics	

* If you have a combination of scripts and have difficulty determining the type, you can make the assumption that they are typical scripts.

The Meridian Configurator will automatically determine how many modules will be required.

To manually determine what type and how many modules will be needed, follow the same steps as above but enter the information in the following worksheets.

Table 10
Meridian Link/CCR load worksheet

Call Types	Calls	Load Factor	Weighted Load
Inbound calls		Calls x 1.0	=
Subsequently transferred calls		Calls x 1.0	=
Outbound calls		Calls x 1.0	=
Preview dialed calls		Calls x 1.0	=
Predictive dialed calls		Calls x 1.1 (successful call) Calls x 1.0 (unsuccessful call)	=
HER calls		Calls x 1.1	=
HEVP calls		Calls x 1.4	=
Meridian Link total			
Basic CCR calls* (10 messages/call)		Calls x 1.0 + (90 x ACD DN ^s)**	=
Typical CCR calls* (20 messages/call)		Calls x 2.0 + (45 x ACD DN ^s)**	=
Complex CCR calls* (30 messages/call)		Calls x 3.0 + (30 x ACD DN ^s)**	=
CCR total			
Grand total (Meridian Link total plus CCR total)			

* Refer to “Determining the complexity of CCR scripts” later in this chapter.

** “ACD DN^s” means the number of ACD DN^s with statistics.

Calculating modules required for co-residency

If the Grand Total is less than 16,500, Meridian Link and CCR can co-reside on an IPE Module or an MVME167-equipped Application Module.

If the Grand Total is larger than 16,500 and the Meridian 1 can handle the call volumes, more than one module will be needed, and you will need separate modules for Meridian Link and CCR.

Due to memory requirements, CCR Release 3B is not supported on Application Modules equipped with the MVME147 card.

Calculating modules required for Meridian Link alone

If the Meridian Link total is less than 10,000, Meridian Link can operate on an IPE Module, a dedicated MVME147-equipped Application Module, or an MVME167-equipped Application Module.

If the Meridian Link total is less than 16,500, Meridian Link can operate on an IPE Module or a dedicated MVME167-equipped Application Module.

Calculating modules required for CCR alone

If the CCR total is less than 16,500, CCR can operate on an IPE Module or a dedicated MVME167-equipped Application Module.

Due to memory requirements, CCR Release 3B is not supported on Application Modules equipped with the MVME147 card.

Example calculation

Following is an example of a filled-in worksheet for an inbound-outbound Meridian 1 call center with Meridian Link and CCR enabled.

Table 11
Meridian Link/CCR load worksheet (example)

Call Types	Calls	Load Factor	Weighted Load
Inbound calls	2,700	2700×1.0	= 2700
Subsequently transferred calls	300	300×1.0	= 300
Outbound calls	500	500×1.0	= 500
Preview dialed calls		$\times 1.0$	=
Predictive dialed calls		$\times 1.1$	=
HER calls		$\times 1.1$	=
HEVP calls		$\times 1.4$	=
Meridian Link total			= 3500
Basic CCR calls		$\text{Calls} \times 1.0 + (90 \times 0)$	=
Typical CCR calls	300	$300 \times 2.0 + (45 \times 5^*)$	= 825
Complex CCR calls		$\text{Calls} \times 3.0 + (30 \times 0)$	=
Meridian CCR total			= 825
Grand total (Meridian Link total plus Meridian CCR total)			4325

In this case, Meridian Link and CCR can be expected to comfortably co-reside on an IPE Module or an MVME167-equipped Application Module.

* Assumes 5 ACD DN's with statistics.

Determining the complexity of CCR scripts

The number of messages generated per call greatly affects the capacity of a CCR system. The number of messages can vary from as few as three to as many as 35 or more.

Factors that influence the number of messages are

- the number of paths through the script, and what happens on each path
- the length and structure of the script
- the way that the call ends

Procedure for systems not yet installed

In determining the complexity of a CCR call, use the following procedure for systems not yet installed:

- 1 Use the most likely path to be taken by the average call handled by the script.
- 2 Analyze the path and calculate the number of messages generated by the commands, based on Table 12.
- 3 If the average call is answered or abandoned, add two messages for overhead. Alternatively, if the calls end in a Force Busy, Force Disconnect, or Route To command, add one message for overhead.

Basic calls have 10 messages or fewer. Typical calls have 11–25 messages. Complex calls have 26 messages or more.

Table 12
CCR commands and messages generated

CCR Command	Number of Messages
GO TO <i>section</i>	0
WAIT <i>seconds</i>	0
SECTION <i>label</i>	0
QUIT	0
QUEUE TO <i>acd_dn</i>	2
REMOVE FROM <i>acd_dn</i>	2
ROUTE TO <i>dn</i>	2
FORCE BUSY	2
FORCE DISCONNECT	2
GIVE RINGBACK	2
GIVE SILENCE	2
GIVE MUSIC <i>music_route</i>	2
GIVE RAN <i>ran_route</i>	3
GIVE IVR <i>ivr_dn</i>	3

For answered and abandoned calls, add two messages for overhead.

Basic CCR call script example

Command	Messages
Queue to 8900	2
Wait 20	0
Give RAN RAN_Route	3
Give Music Easy_listening	2
	7 + 2 (Overhead)
Total	9

Typical script example

Command	Messages
Queue to Main_ACD with Priority 2	2
Queue to Cust_svc with Priority 2	2
Wait 10	
Give RAN RAN_Rte	3
Give Music Music_Rte	2
Section Regular_Loop	
Wait 2	
Goto Change_Priority If Age Of Call > 60	
Goto Regular_Loop	
Section Change_Priority	
Give RAN Agents_Busy	3
Queue to Main_ACD with Priority 1	2
Queue to Cust_ACD with Priority 1	2
Queue to Supv_ACD with Priority 2	2
Quit	
	18 + 2 (Overhead)
Total	20

Complex script example

Command	Messages
/* Check to see if the groups that can answer calls are in Night Service and disconnect the caller if they are */	
Goto Night_Treatment If Night Service	
Main_ACD	
/* Check to see if there are already more than twice as many calls queued as there are agents logged in and force the caller to busy if this is true */	

— continued —

Complex script example, continued

Command	Messages
Force Busy if Total Queued Calls Main_ACD > (2 * Logged Agents Main_ACD)	
Give RAN announce	3
/* get account number */	
Give IVR 2780 with Treatment 2653	3
Give RAN second_msg	3
Give Music Music_Rte	2
Queue to Main_ACD with Priority 3	2
Queue to Second_ACD with Priority 3	2
Wait 10	
Give RAN Agents_busy	3
Section Check_age	
Queue to Main_ACD with Priority 1 If Age Of Call > 120	2
Queue to Second_ACD with Priority 1 If Age Of Call > 120	2
Queue to Backup_group with Priority 1 If Age Of Call > 120	2
Wait 20	
Give RAN agents_still_busy	3
Goto Check_age	
/* This section is not added to the message count because this is a different call path */	
Section Night_Treatment	
Give RAN closed	
Force Disconnect	
	27 + 2 (Overhead)
Total	29

Procedure for installed systems

Use the following procedure for systems that have been installed (from which you have access to traffic reporting information).

- 1 From CCR traffic reports, determine the total number of calls and the number of calls that received particular treatments.

Following is an example of a traffic report for a script named SUPPORT.

Table 13
Traffic report example

Script name	Number of calls	Treatment	Number of calls attempted
SUPPORT	1202	QUEUE TO	1194
		QUIT	1194
		WAIT	1194
		ABANDONED	1185
		RINGBACK	1202

In this example, the following information are reported:

- The total number of calls is 1202.
- 1194 calls received QUEUE TO, QUIT, and WAIT treatments.
- 1185 calls were abandoned.
- 1202 calls received ringback.

- 2 Using Table 12, calculate the number of messages generated by each treatment.

In the example:

1194 QUEUE TO treatments x 2 = 2388 messages

1194 QUIT treatments x 0 = 0 messages

1194 WAIT treatments x 0 = 0 messages

1185 ABANDONED overhead x 2 = 2370 messages

1202 RINGBACK treatments x 2 = 2404 messages

Total = 7162 messages

- 3 Calculate the total number of messages and divide by the total number of calls to obtain the number of messages per call. Then, using Table 14, determine whether the script is basic, typical, or complex.

Table 14
Determining the complexity of a script

Messages per call	Type of script
≤ 10	Basic
11–29	Typical
≥ 30	Complex

In the example:

• Total number of messages = 7162

• Total number of calls = 1202

Messages per call = 7162 / 1202

= 5.96

Therefore, the script is basic.

Tips to assist CCR engineering

This section provides tips that can help you to reduce the demand at peak periods; it can also help you to improve the efficiency of scripts.

Tips to reduce the demand at peak periods

- Schedule maintenance activities for periods of low traffic.
- Schedule midnight routines (for example, backups) to periods of low traffic.
- Perform manual backups during periods of low traffic.
- Perform modem activity during periods of low traffic.
- Schedule CCR module midnight activities at different times from the Meridian 1 midnight activities.
- Schedule CCR module midnight activities (including scheduled backups) at least one hour before or after midnight. During midnight activities, the CCR module processor is synchronized to the Meridian 1 system. If the Meridian 1 clock is slow, and the clock synchronization is done when the CCR module clock is just past midnight, the CCR module clock may be set back to the previous day, causing midnight routines to be executed twice.
- When the clock needs to be changed backwards (for example, when changing from Daylight Savings Time to Standard Time), schedule this activity so that the day remains the same. In other words, do not change it around midnight.

Script writing tips

- You can improve the capacity of the CCR system by limiting the number of ACD DN's for which the Meridian 1 system sends statistics to CCR. Check all ACD variables in the Variable Table and discard any that are not used by any script.
- Delete all WAIT commands that directly precede a QUIT command. For example, by deleting the WAIT statement in the following command sequence, you reduce the waiting time while maintaining the same effect.

```
GIVE RAN ran_route
WAIT 20
QUIT
```

- Avoid starting scripts with a sequence of commands that have no waiting time. Such a command sequence causes a burst of messages for every new call. For example, a script starting with the following command sequence

```
QUEUE TO 8900
QUEUE TO 8901
QUEUE TO 8902
QUEUE TO 8903
GIVE RAN ran_route
```

can be very inefficient if calls find an idle agent at ACD 8900. The QUEUE TO commands for 8901, 8902, and 8903 may execute and generate unneeded messages before the Meridian 1 system can indicate that the call has been presented to ACD 8900.

Breaking up the sequence of QUEUE TO commands by adding WAIT commands makes the sequence more efficient.

```
QUEUE TO 8900
WAIT 2
QUEUE TO 8901
WAIT 2
QUEUE TO 8902
WAIT 2
QUEUE TO 8903
GIVE RAN ran_route
```

However, this solution increases the execution time of the script, and may not be acceptable in some circumstances. An alternative solution may be to make the second QUEUE TO command conditional.

```
QUEUE TO 8900
QUEUE TO 8901 IF (Idle Agents 8900 = 0)
.
.
.
GIVE RAN ran_route
```

Summary

The method you should use to analyze a script is as follows:

- 1** Identify the call types of the script.
- 2** Analyze the call types and create a table showing the execution time and messages created by each command, and the overhead messages created by the call type. Refer to Tables 18 and 19 for examples.
- 3** Create a spreadsheet for the script using average times and percentages of the total calls for each call type, and use the spreadsheet to calculate the average number of messages per call for the script. Refer to Tables 21, 22, and 23 for examples.
- 4** Use the average number of messages per call to estimate the capacity of the CCR module from Figures 11, 12, and 13.